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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/789,185	02/20/2001	Steven K. Case	A48.12-0004	6021

JKC
7590 12/17/2001
WESTMAN, CHAMPLIN & KELLY
SUITE 1600 - INTERNATIONAL CENTRE
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319

DOCKETED	12/17/01
RESPONSE DUE	3-17-02
CALENDARED	3-17-02
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EXAMINER

WOOD, KEVIN S

ART UNIT PAPER NUMBER

2874

DATE MAILED: 12/17/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/789,185

Applicant(s)

CASE ET AL.

Examiner

Kevin S Wood

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-24 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: *Ben Heeg*

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 2, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,074,103 to Hargreaves et al.

Referring to Claim 1, Hargreaves et al. discloses all the limitations of the claimed invention. Hargreaves et al. discloses an optical module comprising: an optical

component (5); a relative reference mount (4) having a registration feature to couple to a registration feature (11) of a fixed reference mount (1); and solder (43) configured to secure the optical component at a fixed position relative to the relative reference mount registration feature. Hargreaves et al. discloses a support member (4) that holds an optical fiber (5) relative to a base (1), where the end of the support member fits into a trench (11). The end of the support member and the trench in the base form the registration features for coupling the two components together.

Referring to Claim 2, Hargreaves et al. discloses all the limitations of the claimed invention. Hargreaves et al. discloses that the support member (4) contains a heating element (44,45) that is configured to melt the solder (43).

Referring to Claim 11, Hargreaves et al. discloses all the limitations of the claimed invention. Hargreaves et al. discloses that relative reference mount (4) and the fixed reference mount (1) are relatively planar. See Fig. 1.

4. Claims 16, 17, 18, 22, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,671,315 to Tabuchi et al.

Referring to Claim 16, Tabuchi et al. discloses all of the limitations of the claimed method. Tabuchi et al. discloses a method of making an optical module comprising: obtaining an optical component (45); obtaining a relative reference mount (31); positioning the relative reference mount and the optical component proximate each other with solder therebetween, wherein there is a gap between the solder and the optical component; heating the solder to cause the solder to change state and flow into

and fill the gap due to a surface tension effect; and cooling the solder to thereby fix the relative positions of the relative reference mount and the optical component. See Fig. 9(A-C) and the respective portion of the specification.

Referring to Claim 17, Tabuchi et al. discloses all of the limitations of the claimed method. Tabuchi et al. discloses the use of registration features (77a,77b) to position the optical component (77) relative registration features (66a,66b) on relative reference mount (61).

Referring to Claim 18, Tabuchi et al. discloses all of the limitations of the claimed method. Tabuchi et al. discloses tensile force within the solder serves to draw the optical component (45) toward the relative reference mount (31). See col. 10, lines 4-13.

Referring to Claim 22, Tabuchi et al. discloses all of the limitations of the claimed method. Tabuchi et al. discloses that the device can be accurately positioned in the lateral and vertical directions. It is inherent that the device could be positioned with respect to 6 degrees of freedom.

Referring to Claim 23, Tabuchi et al. discloses all of the limitations of the claimed method. Tabuchi et al. discloses that the tapered solder flows to a large surface area when heated. See Fig. 9(A-C) and the respective portion of the specification.

Referring to Claim 24, Tabuchi et al. discloses all of the limitations of the claimed invention. Tabuchi et al. discloses an optical module made in accordance with claim 16. See Fig.9A.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3-6, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,106,161 to Basavanhally et al. in view of U.S. Patent No. 5,6711,315 to Tabuchi et al.

Referring to Claim 3, Basavanhally et al. discloses an optical module comprising: an optical component (2); a relative reference mount (6) coupled to a fixed reference mount (8); and solder (5) configured to secure the optical component at a fixed position relative to the relative reference mount registration feature. Basavanhally et al. does

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not disclose: the relative reference mount having a having a registration feature to couple to a registration feature of the fixed reference mount; or the relative reference mount including a bonding pad to promote adhesion of the relative reference mount to the solder.

Tabuchi et al. discloses a component (77) having registration features (77a,77b) to couple to registration features (66a,66b) of a reference mount (61) for the purpose aligning the component relative to the reference mount with high accuracy in both lateral and vertical directions. See col. 5, lines 10-20. Tabuchi et al. also discloses the use of a bonding pads (72,73,74) for the purpose of coupling the component (77) so that heat generated in the component would be transferred to the reference mount (61). See col. 13, lines 25-32.

Since Basavanhally et al. and Tabuchi et al. are both from the same field of endeavor, the purposes disclosed by Tabuchi et al. would have been recognized in the pertinent art of Basavanhally et al. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the registration features and the bonding pads for the purpose of accurately aligning and thermally coupling components as disclosed by Tabuchi et al.

Referring to Claim 4, Basavanhally et al. in view of Tabuchi et al. discloses all of the limitations of the claimed invention. Tabuchi et al. discloses bonding pads (78a,78b,78c) which are coupled to the component (77). The pads are used to thermally couple the component to the solder.

Referring to Claim 5, Basavanhally et al. in view of Tabuchi et al. discloses all of the limitations of the claimed invention. Tabuchi et al. discloses an optical component (45b) is mounted within an optical component mount (45), which is bonded by solder to the reference mount (31).

Referring to Claim 6, Basavanhally et al. in view of Tabuchi et al. discloses all of the limitations of the claimed invention. Basavanhally et al. discloses the solder over an area (5) that covers the entire bottom of the optical component.

Referring to Claim 12, Basavanhally et al. in view of Tabuchi et al. discloses all of the limitations of the claimed invention. Tabuchi et al. discloses the use grooves to align components and the use of solder for thermally coupling the aligned components. It is obvious that the means disclosed by Tabuchi et al. for attaching the two components could also be applied to the coupling of the relative reference (6) and the fixed reference (8) of Basavanhally et al. for the same reasons.

Referring to Claim 13, Basavanhally et al. in view of Tabuchi et al. discloses all of the limitations of the claimed invention. Tabuchi et al. discloses that the tapered solder region (49) and a large surface area region (41), where the solder flows from the tapered region to the large surface area region. See Fig. 9B and Fig. 9C.

7. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,106,161 to Basavanhally et al. in view of U.S. Patent No. 5,671,315 to Tabuchi et al. and U.S. Patent No. 5,700,987 to Basavanhally.

Referring to Claim 7, Basanvanhally et al. in view of Tabuchi et al. disclose all of the limitations of the claimed invention except that there is a heater element configured to melt the solder and that electrical conductors are coupled to the heater element.

Basanvanhally discloses the use of heating elements, with electrical conductors attached them, for the purpose of expediently reflowing and cooling the solder elements. See col. 3, lines 16-30. Since Basanvanhally et al. and Basavanhally are both from the same field of endeavor, the purpose disclosed by Basavanhally would have been recognized in the pertinent art of Basavanhally. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to include heating elements for the purpose of expediently reflowing the solder elements as taught by Basavanhally.

Referring to Claim 8, Basanvanhally et al. in view of Tabuchi et al. and Basavanhally disclose all of the limitations of the claimed invention. Basavanhally discloses that the heater is a resistive heating element. See col. 3, line 20.

Referring to Claim 9, Basanvanhally et al. in view of Tabuchi et al. and Basavanhally disclose all of the limitations of the claimed invention. Basavanhally discloses that the heating elements would be connected to the reference mount (16).

Referring to Claim 10, Basanvanhally et al. in view of Tabuchi et al. and Basavanhally disclose all of the limitations of the claimed invention. Basavanhally discloses that the heating element groups would be actuated sequentially. See col. 3, lines 16-30.

8. Claims 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,106,161 to Basavanhally et al. in view of U.S. Patent No. 5,671,315 to Tabuchi et al. and U.S. Patent No. 6,327,407 to Mitsuda et al.

Referring to Claim 15, Basavanhally et al. in view of Tabuchi et al. discloses all the limitations of the claimed invention except that the solder is electrically connected to the optical component. Mitsuda et al. discloses solder bumps that are electrically connected to an optical element for the purpose of transmitting the electrical signal transmitted or received by the optical component to other components. See col. 5, lines 44-65. Since Basavanhally et al. and Mitsuda et al. are both from the same field of endeavor, the purpose of Mitsuda et al. would have been recognized in the pertinent art of Basavanhally. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide solder connections that conduct electrical signals for the purpose of allowing the optical component to transmit and to receive electrical signals to and from other components.

9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable U.S. Patent No. 5,671,315 to Tabuchi et al. in view of U.S. Patent No. 5,700,987 to Basavanhally.

Referring to Claim 19, Tabuchi et al. discloses all of the limitations of the claimed method except for disclosing that heating the solder comprises energizing an electrical heater element. Basavanhally discloses the method of making an optical module including the energizing an electrical heater element to heat the solder for the purpose

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of expediently reflowing and cooling the solder elements. See col. 3, lines 16-30. Since Tabuchi et al. and Basavanhally are both from the same field of endeavor, the purpose disclosed by Basavanhally would have been recognized in the pertinent art of Tabuchi et al. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to energize heating elements for the purpose of expediently reflowing the solder elements as taught by Basavanhally.

Referring to Claim 20, Tabuchi et al. in view of Basavanhally discloses all of the limitations of the claimed method. Basavanhally discloses connecting contacts (26) which couple the electrical heating element to a battery (25). See col. 3, lines 16-30.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable U.S. Patent No. 5,671,315 to Tabuchi et al. in view of U.S. Patent No. 5,644,668 to Chambers et al.

Referring to Claim 21, Tabuchi et al. discloses all of the limitations of the claimed method except that the heating the solder comprises applying radiation. Chambers et al. discloses that radiation may be used in heating solder for the purpose of attaching optical elements. See col. 9, lines 58-66. Since Tabuchi et al. and Chambers et al. are both from the same field of endeavor, the purpose disclosed by Chambers et al. would have been recognized in the pertinent art of Tabuchi et al. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use radiation to heat solder for the purpose using the solder to attach optical elements.

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Allowable Subject Matter

11. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,222,579 to Sousa

U.S. Patent Publication No. 2001/0010743 to Cayrefourcq et al.

These references show the current state of the art. Cayrefourcq et al. discloses an optical module that includes solders and alignment features, while Sousa discloses an optical module that includes stacked components connected by solder.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin S Wood whose telephone number is (703) 605-5296. The examiner can normally be reached on Monday-Thursday (7am - 5:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B Bovernick can be reached on (703) 308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 307-0956.

ksw
December 11, 2001

A handwritten signature in black ink, appearing to read "Brian Healy". The signature is fluid and cursive, with the first name "Brian" and last name "Healy" clearly distinguishable.

Brian Healy
Primary Examiner

FORM PTO-1449	Atty. Docket No.: A48.12-0004	Appl. No.: 09/789,185
<p>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</p> 	First Named Inventor:	
	Steven K. Case	
	Filing Date	Group Art:
	February 20, 2001	2874

U.S. PATENT DOCUMENTS

Examiner Initial	Document No.	Date	Name	Class	Sub Class	Filing Date If Appropriate
KSW	AA	4,457,467	7/3/84	Klement et al.	228	103
KSW	AB	4,708,429	11/24/87	Clark et al.	350	96.20
KSW	AC	4,798,439	1/17/89	Preston	350	96.20
KSW	AD	4,892,377	1/9/90	Randle	350	96.2
KSW	AE	5,113,404	5/12/92	Gaebe et al.	372	36
KSW	AF	5,210,811	5/11/93	Avelange et al.	385	91
KSW	AG	5,247,597	9/21/93	Blacha et al.	385	88
KSW	AH	5,249,733	10/5/93	Brady et al.	228	180.22
KSW	AI	5,283,446	2/1/94	Tanisawa	257	433
KSW	AJ	5,478,778	12/26/95	Tanisawa	437	183
KSW	AK	5,499,312	3/12/96	Hahn et al.	385	91
KSW	AL	5,550,088	8/27/96	Dautartas et al.	437	225
KSW	AM	5,568,892	10/29/96	Basavanhally	228	180.22
KSW	AN	5,574,561	11/12/96	Boudreau et al.	356	399
KSW	AO	5,603,870	2/18/97	Roll et al.	264	1.25
KSW	AP	5,659,641	8/19/97	DeMeritt et al.	385	14
KSW	AQ	5,700,987	12/23/97	Basavanhally	219	56.1

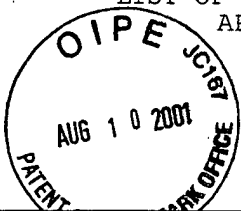
FOREIGN PATENT DOCUMENTS

	Document No.	Date	Country	Class	Sub Class	Translation Yes No
AR						

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AS	
EXAMINER: Kevin S. Wood	DATE CONSIDERED: 12-10-01

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449		Atty. Docket No.: A48.12-0004	Appl. No.: 09/789,185
 <p>LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT</p>		First Named Inventor:	
		Steven K. Case	
		Filing Date	Group Art:
		February 20, 2001	2874

U.S. PATENT DOCUMENTS

Examiner Initial	Document No.	Date	Name	Class	Sub Class	Filing Date If Appropriate
KSW	AT	5,745,624	4/28/98	Chan et al.	385	91
KSW	AU	5,748,827	5/5/98	Holl et al.	385	134
KSW	AV	5,833,202	11/10/98	Wolfgang	248	466
KSW	AW	5,854,867	12/29/98	Lee et al.	385	49
KSW	AX	5,892,179	4/6/99	Rinne et al.	174	261
KSW	AY	5,985,086	11/16/99	Peall	156	292
KSW	AZ	6,027,253	2/22/00	Ota et al.	385	83
KSW	BA	6,106,161	8/22/00	Basavanhally et al.	385	88
KSW	BB	6,155,515	9/5/00	Itoh et al.	285	14
KSW	BC	6,118,917	9/12/00	Lee et al.	385	49
KSW	BD	6,132,106	10/17/00	Yokoyama	385	74
KSW	BE	6,151,173	11/21/00	Massit et al.	359	811
KSW	BF	6,160,936	12/12/00	You et al.	385	49
KSW	BG	6,164,837	12/26/00	Haake et al.	385	90
KSW	BH					

FOREIGN PATENT DOCUMENTS

		Document No.	Date	Country	Class	Sub Class	Translation Yes No
KSW	BI	0 977 061 A2	2/2/00	EPO			X
KSW	BJ	63-193113	8/10/88	Japan			

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

KSW	BK	"Micro-Mechanical Alignment Structures (patent pending)", from Web Site of Axsun Technologies, 2 pages, downloaded 2/15/01.					
KSW	BL	"An Innovative Flexible and Accurate Packaging Technique Suited to Fabricate Low Cost Micro Optoelectronic Modules", by M. Scussat et al., <u>Electronic Components and Technology Conference</u> , 2000, pgs. 26-32.					

EXAMINER: Kevin S. Wood

DATE CONSIDERED: 12-10-01

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Notice of References Cited	Application/Control No. 09/789,185	Applicant(s)/Patent Under Reexamination CASE ET AL	
	Examiner Kevin S Wood	Art Unit 2874	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
5	A	US-6074103-B1 /	06-2000	Hargreaves et al.	385/90
3	B	US-5671315-B1 /	09-1997	Tabuchi et al.	385/137
6	C	US-6106161-B1 /	08-2000	Basavanhally et al.	385/88
4	D	US-5700987-B1 /	12-1997	Basavanhally	219/56.1
8	E	US-6327407-B1 /	12-2001	Mitsuda et al.	385/49
2	F	US-5644668-B1 /	07-1997	Chambers et al.	385/90
7	G	US-6222579-B1 /	04-2001	Sousa	347/241
1	H	US-0010743-A1 /	08-2001	Cayrefourcq et al.	385/88
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.